Environmental Health Perspectives
Vol. 9, pp. 203–204, 1974

Commentary

Lymphohematogenous Spread of Asbestos

by Arnold Brown*

I would like to make a few comments and pose a question or two concerning the question of the lymphohematogenous spread of asbestos. The paper by Godwin and Jagatic *(1)* is one of the more important publications that I have come across concerning the distribution of fibers in patients in whom there was both asbestosis and mesothelioma. This study was done very carefully and demonstrated rather nicely the presence of fibers in various organs throughout the body including the spleen and lymph nodes, hilar lymph nodes particularly. Another study with of considerable interest is by Kanazawa et al. *(2)*. They injected crocidolite subcutaneously in rats and found the regional lymph nodes to be rather heavily involved by these fibers.

The fact that these fibers apparently can cross various natural barriers such as the endothelial wall and the gastric, small intestinal, and even colonic epithelium seems to be fairly well shown. This raises several very interesting questions. Those of us who have had an opportunity over the years to look at the gastric and intestinal mucosa are very impressed by the dynamic nature of this epithelial surface. The epithelial surface of the gastro intestinal tract is a highly dynamic structure, the cells changing shape and size continuously. The renewal rate varies somewhat, but is in the range of 2–5 days. So when you have a very dynamic situation all sorts of things can happen, including the insorption of relatively large particles, which you would not ordinarily predict from the static, dead epithelium that is necessary for our observations to be made.

The insorption of such fibers should be studied as a function of their size and chemistry. A great deal of discussion has occurred in recent months concerning the size of fibers which actually have biological effects. The question has also been raised whether this might or might not be a function of the chemistry of the fibers as well. Up to now, only a few fibers have been studied. Crocidolite, chrysotile, and others must be examined with the careful techniques that are now available in order to see if there is a difference between fiber species in terms of deposition in mesenteric and other lymph nodes. The clearance rates are exceedingly important, and I look forward to what I hope will be some curves which will allow us to draw conclusions regarding the tissue turnover time of fibers. How fast is it in the lung is particularly important, but also in the kidney, brain and other organs. I find it fascinating to speculate privately as to just how the body does get rid of these fibers. It appears that all sorts of things can pollute our blood streams, and I have developed the notion that our blood is more or less a garbage route that carries a multitude of undesirable things. The question is, how does the body get rid of them? Obviously it must. To date, I have seen no work that would help us with this problem.

Finally, an important—perhaps the most important—question is, what sort of damage can we anticipate in lymph nodes and in various organs as a consequence of the lodgement there of fibers of various sizes and chemistry? What is

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the accumulation level that must occur before disease actually develops occurs. A knowledge of the injury reaction and of the tissue dose–response curve would go far to provide us with the basis for determining just how much asbestos and what kind, if any, humans can safely tolerate.

REFERENCES

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